

INSTALLATION RESTORATION PROGRAM

Decision Document for Soil and Groundwater at the Suspect Burial Area, Site 4

144TH FIGHTER WING
CALIFORNIA AIR NATIONAL GUARD
FRESNO AIR TERMINAL, FRESNO, CALIFORNIA



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**Draft Decision Document
for Soil and Groundwater at the Suspect Burial Area, Site 4
144th Fighter Wing, California Air National Guard
Fresno Air Terminal
Fresno, California**

Submitted to:

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January 1996

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1.0 Introduction

This decision document (DD) for Site 4 - the Suspect Burial Area at the California Air National Guard (ANG) Base, Fresno, California (the Base), is being submitted under the requirements of the U.S. Department of Defense Installation Restoration Program (IRP) and the Comprehensive Environmental Response, Compensation and Liability Act, as amended by Superfund Amendments and Reauthorization Act.

1.1 Purpose

The objective of this DD is to provide technical rationale to support no further action at Site 4. Implementation of this recommended alternative would preclude any future remedial investigation/feasibility study (RI/FS) activities at the site.

Site 4 has been determined to pose no significant threat to public health or the surrounding environment based on evaluations of possible source areas, sampling data, pathways and contaminant receptors. The information presented herein is a synopsis of activities and results of various stages of investigative work. Detailed evidence on which the decision for no further action is based can be found in its entirety in the Site Investigation (SI) Report, (IT Corporation [IT], 1992a) and the Quarterly Groundwater Monitoring Report, June-July, 1992 (IT, 1992b).

1.2 Location

The California ANG leases approximately 140 acres of land from the City of Fresno on three different parcels inside the Fresno Air Terminal boundaries (Figure 1). Site 4 is in the southeast portion of the Terminal. The location of Site 4 at the Fresno Air Terminal is shown on Figure 1.

1.3 Environmental Setting

To better understand the rationale for the no further action decision at Site 4, the following paragraphs describe the environmental setting and possible migration potential in the vicinity of the site.

1.3.1 Climate

The climate is characterized by hot, dry summers and cool, moist winters. Mean monthly temperatures range from 46°F in December to 85°F in July. Winds are generally from the northwest. The average annual precipitation is less than 10 inches in the Fresno area. More

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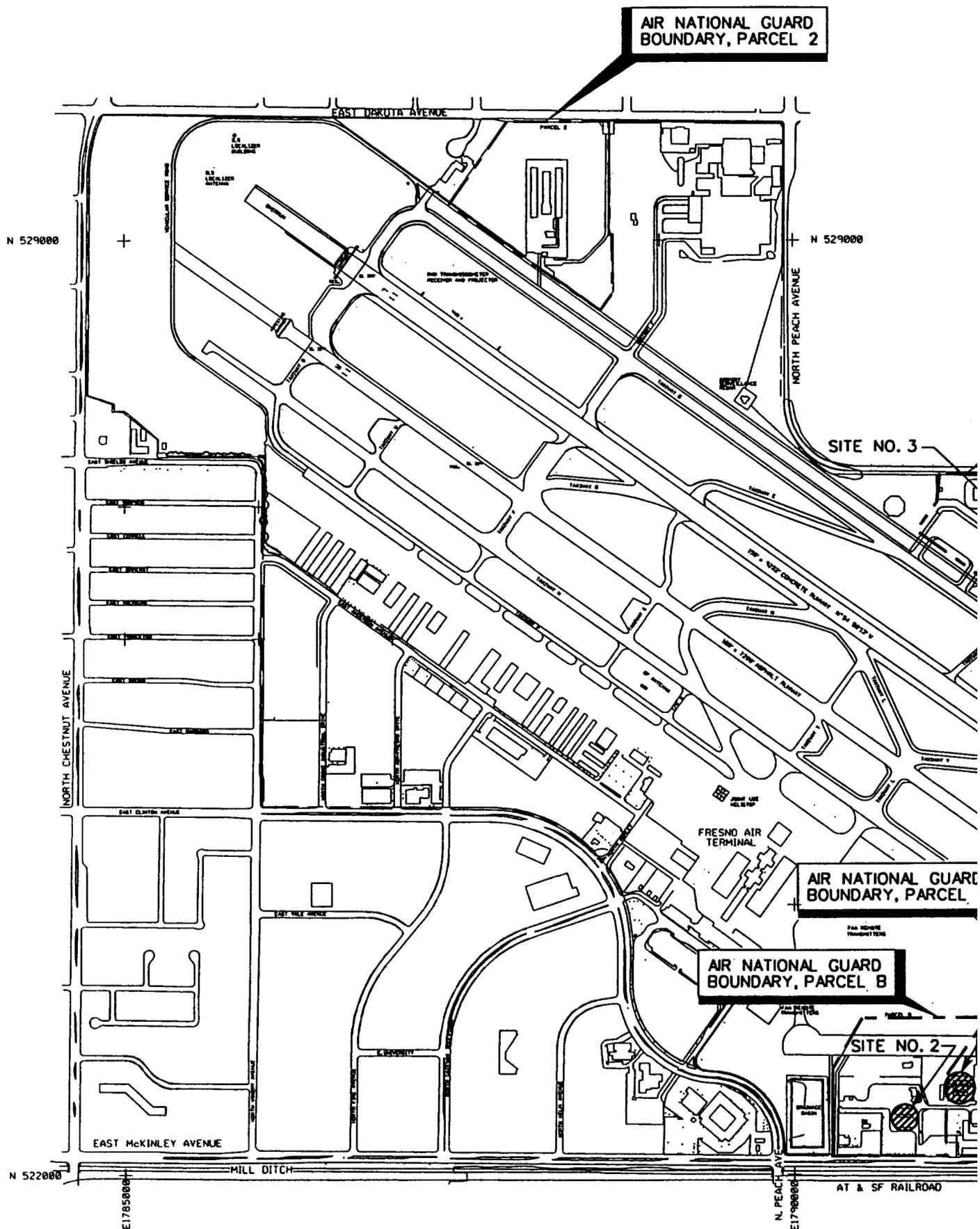
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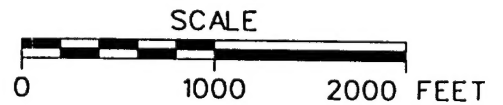
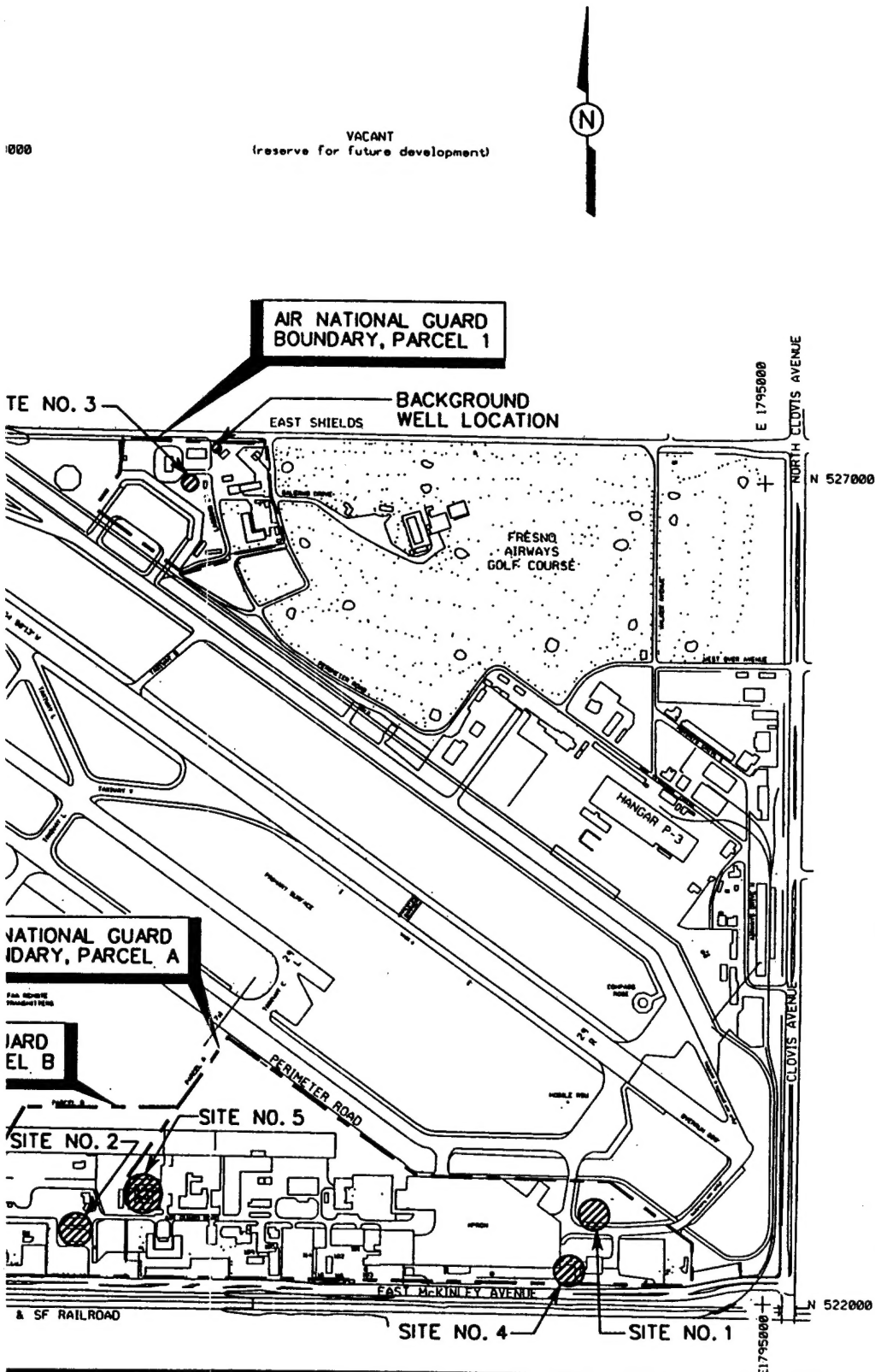


FIGURE 1
BASE MAP LOCATION OF
IDENTIFIED INVESTIGATION SITES

CALIFORNIA AIR NATIONAL GUARD
FRESNO AIR TERMINAL
FRESNO, CALIFORNIA

IT INTERNATIONAL
TECHNOLOGY
CORPORATION

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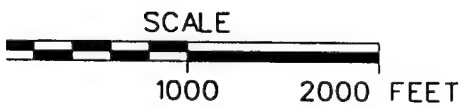


FIGURE 1
 BASE MAP LOCATION OF
 IDENTIFIED INVESTIGATION SITES

CALIFORNIA AIR NATIONAL GUARD
 RESNO AIR TERMINAL
 RESNO, CALIFORNIA

than 90 percent of the yearly precipitation occurs between October and April. Yearly rainfall varies widely from year to year and shows long-term wet and dry periods. The mean evaporation rate is 66 inches per year.

1.3.2 Geology

At the Base, the geology is characterized by alluvial fan deposits (Cehrs, et al., 1979). The fans have a low surface relief with very gentle gradients. Deposits in these fans are associated with an alluvial flood plain regime. Sediments in the fans range from clays to gravel, with finer sediments (silts and clays) associated with overbank and flood plain deposits, and coarser sediments (sands and gravels) associated with levee, crevasse splay, channel lag, and point bar deposits.

1.3.3 Hydrogeology

In the Fresno area, all municipal and rural domestic water is pumped from the alluvial aquifers. The aquifer system has been described as unconfined or semiconfined depending on local hydrogeologic conditions (Cehrs, et al., 1979; Steele, 1986). At the Base, the water table is approximately 80 feet below ground surface, sloping generally to the southwest. Groundwater flow through the alluvial sediments comprising the aquifer system beneath the Fresno area is controlled by the slope of the water table (to the southwest) and the occurrence of coarse-grained sediments within the alluvial fans. In the Fresno area, groundwater flows generally to the southwest and preferentially through coarse-grained channel deposits.

2.0 Background

The Air National Guard Readiness Center (ANGRC) instituted a comprehensive IRP to assess the extent of suspected chemical contamination that may have resulted from past handling and disposal practices at the Base. The ANGRC designed the IRP to generate data of sufficient quality during a SI that will support one or more of the following recommendations:

- Generate a DD recommending no further action
- Initiate a focused feasibility study/remedial measure
- Implement a remedial response
- Initiate a RI/FS.

Results of the investigation programs at Site 4 indicate that no further action is warranted at this site. General supporting information is presented in the following sections.

2.1 Site History

In April 1988, a preliminary assessment was completed by the Hazardous Material Technical Center focusing on past and present generation, use, handling, and disposal practices of hazardous waste materials. Based on the findings of the PA, three suspect sites potentially contaminated with hazardous waste/hazardous materials were identified and were recommended for further IRP investigation. The Suspect Burial Area was added to the areas to be investigated at the ANGRC's initiative based on excavated refuse material encountered during construction of a water line in the early 1970s. Additional refuse was discovered when the revetment next to McKinley Avenue was under construction in the late 1980s. Typical items unearthed included household goods, stoves, plates, scrap metal, and building materials from disposal practices when the airport was used as an air base by the Army Air Corps. The Suspect Burial Area was therefore added to the IRP as Site 4.

Site 4 was identified as approximately 50 feet wide (north-south) by 150 feet long (east-west) and is located primarily between the revetment (wall) and McKinley Avenue. The routing of the water line was parallel and adjacent to McKinley Avenue on Base property. Based on information from former personnel involved in the construction, the buried waste appeared to be localized in a trench located 35 feet north of the fence line along McKinley Avenue.

2.2 Investigation Results

A SI was conducted to confirm or deny the presence of contamination, to identify the presence and concentrations of specific chemical contaminants in both soil and in the

uppermost water-bearing unit and to assess geologic, hydrogeologic and geochemical conditions at Site 4. As part of the SI, a surface geophysical and soil organic vapor (SOV) survey were conducted, test pits were excavated and sampled and monitoring wells were installed.

2.2.1 Geophysical Survey and SOV Survey Results

Results of the geophysical survey were used to select test pit locations such that metallic debris/objects would be encountered during their excavation. An SOV survey was conducted to detect localized volatile organic contamination across the site (Figure 2).

A total of 53 soil samples were collected during the SOV survey and were analyzed for benzene, toluene, ethyl benzene, total xylenes, total petroleum hydrocarbons (TPH), trichloroethane, trichloroethene and tetrachloroethene.

Isolated volatile petroleum hydrocarbon concentrations were found to exceed the level of significance at four separate sampling locations, however definable plumes were not delineated. Several other samples contained measurable levels of total hydrocarbons, but did not exceed the level of significance or delineate any contaminant plumes.

2.2.2 Test Pit Excavation and Sampling Results

Eight test pits were excavated in the locations shown on Figure 3 to define disposal areas and to visually examine any past disposal debris and/or signs of contamination. Their locations were based on the results of the SOV survey and surface geophysical data. No items observed during excavation of the test pits suggested that any hazardous materials or hazardous wastes had ever been disposed of in this area. A total of 12 soil samples (including duplicate) were collected from the eight test pits. The soil samples were analyzed for volatile and semivolatile organics, polychlorinated biphenyls (PCB), TPH-diesel, total organic lead, and the California Code of Regulations (CCR) list of metals.

Of the samples collected from the test pits, two volatile organic compounds (VOC) were detected in the 12 samples. Acetone was detected at a concentration of 57 micrograms per kilogram ($\mu\text{g}/\text{kg}$) in one sample and methylene chloride was detected at concentrations ranging from 15 to 29 $\mu\text{g}/\text{kg}$ in three samples.

Semivolatile compounds were detected in four samples (one duplicate) collected from the test pits. The following compounds were detected in samples collected from three test pits:

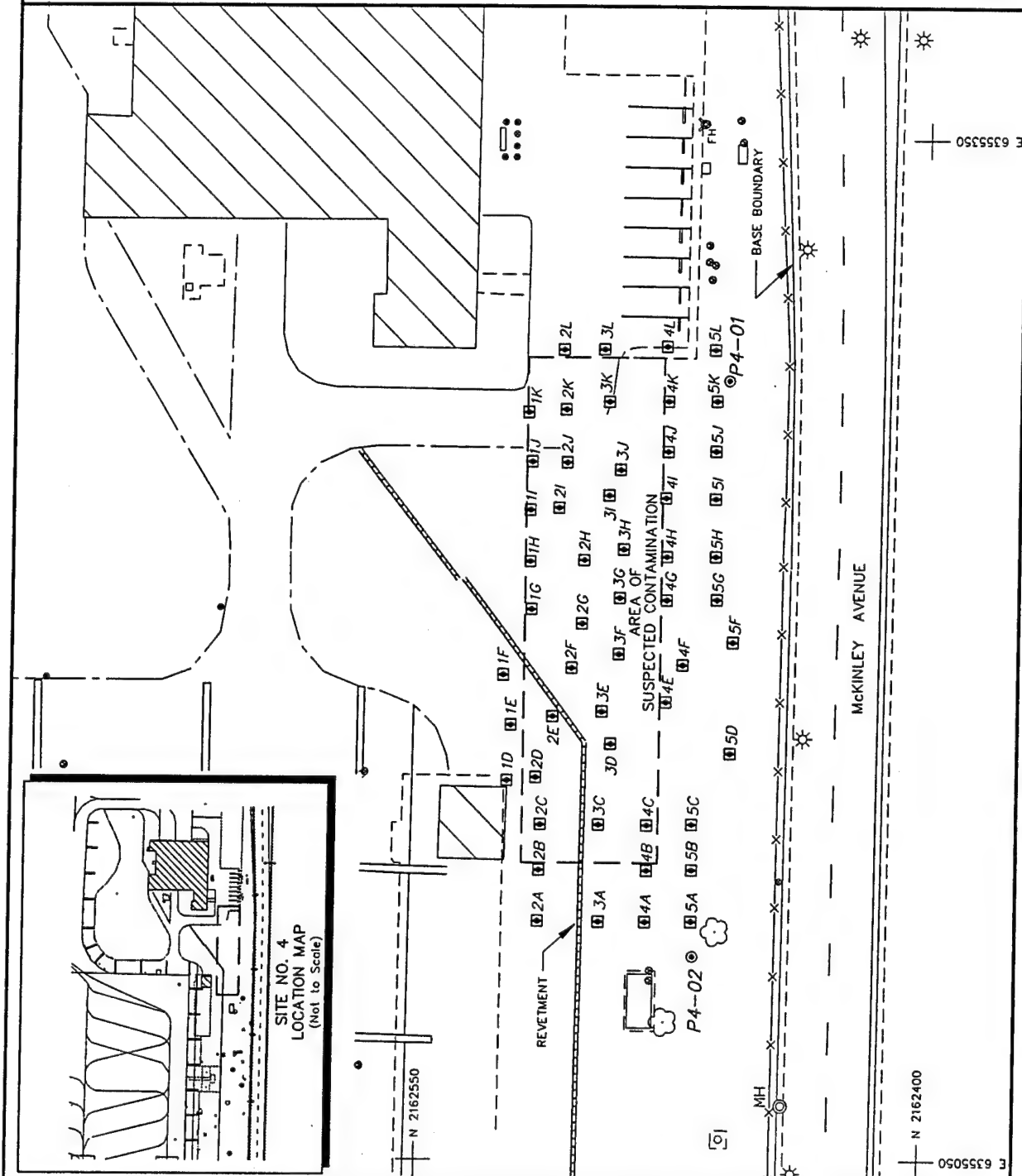
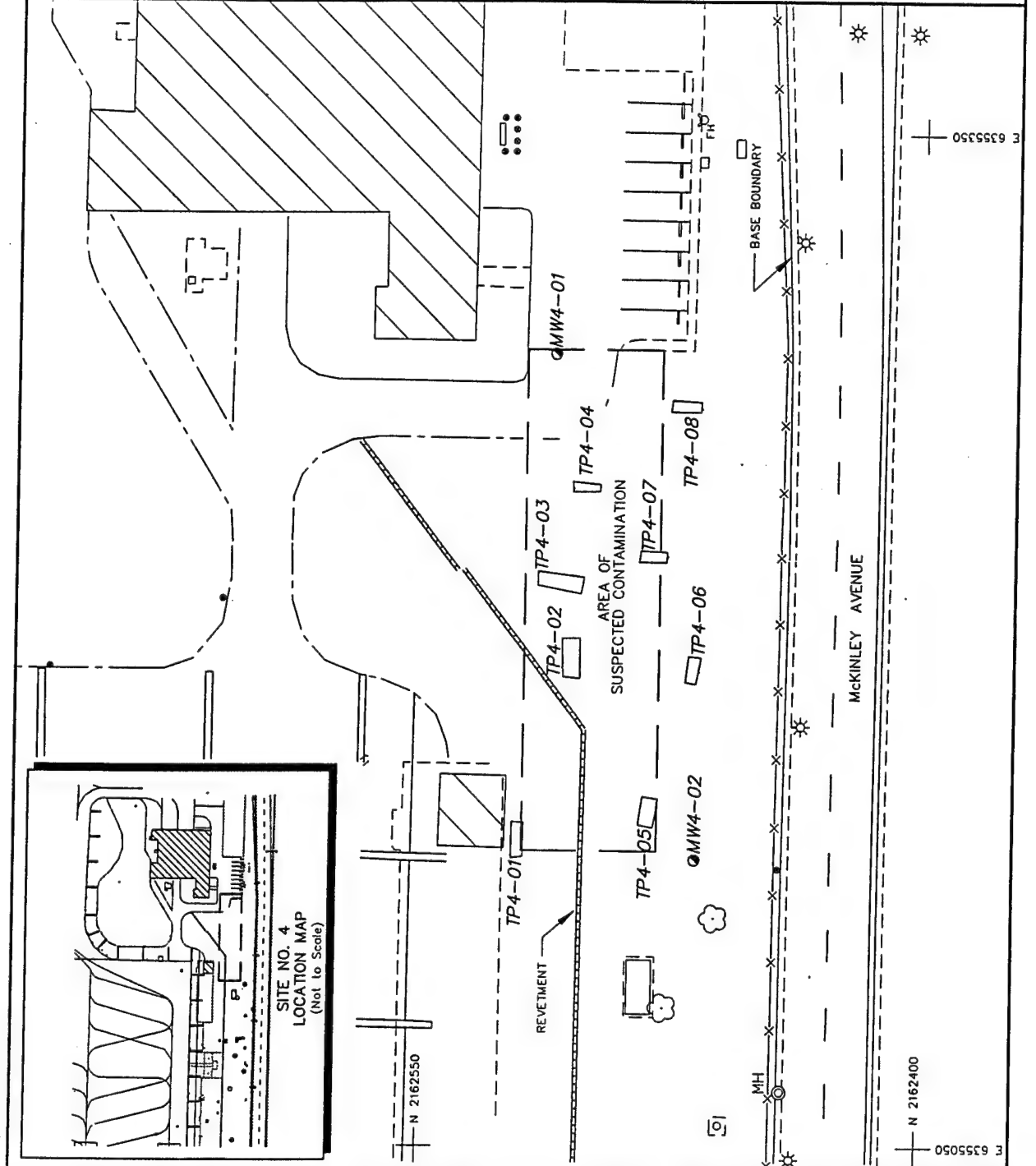


FIGURE 2
FIELD SCREENING LOCATIONS AT
SITE NO. 4-SUSPECT BURIAL AREA
CALIFORNIA AIR NATIONAL GUARD
FRESNO AIR TERMINAL
FRESNO, CALIFORNIA





LEGEND:

- MW4-01 MONITORING WELL
- TP4-01 TEST PIT
- ✱ LIGHT POLE
- ⊕ FIRE HYDRANT
- FENCE LINE
- ⊗ TREE

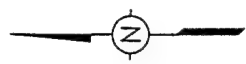


FIGURE 3
 TEST PIT & MONITORING WELL
 LOCATIONS AT SITE NO. 4—
 SUSPECT BURIAL AREA
 CALIFORNIA AIR NATIONAL GUARD
 FRESNO AIR TERMINAL
 FRESNO, CALIFORNIA
IT INTERNATIONAL
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- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(g,h,i)perylene
- Benzo(k)fluoranthene
- Chrysene
- Di-n-butyl phthalate
- Fluoranthene
- Indeno(1,2,3-cd)pyrene
- Pyrene and bis(2-ethylhexyl)phthalate.

Many of the levels reported for these compounds were estimated concentrations below the quantitation limits. The presence of these semivolatiles is likely due to incomplete burning of some of the items unearthed in this area.

There were no reportable values of pesticides, PCBs, or TPH for the test pit samples.

Concentrations of metals were compared to site-specific background ranges and U.S. Geological Survey (USGS) established ranges (1984). Six analytes exceeded one or both of the upper background ranges in one test pit. Four analytes exceeded at least one of the upper background ranges in another test pit. Two test pits did not contain any analytes exceeding background ranges. All other test pit samples contained at least one analyte that exceeded an upper background limit.

Lead appears to be the analyte that most consistently exceeds one or both of the background range limits. It appears in five of the eight test pits at levels above the site-specific Fresno ANG background limit of 7.33 milligrams per kilogram (mg/kg). The upper USGS range of 20 mg/kg is exceeded in three of the test pit samples. Lead concentrations above established limits range from 7.7 to 123 mg/kg.

Arsenic is also found to exceed the site-specific background limit of 0.55 mg/kg in five of the test pit samples with a maximum value of 3.5 mg/kg. There does not appear to be a distinct areal pattern to the arsenic detections.

Other elements detected at levels exceeding background ranges but not as frequently as arsenic or lead include antimony (exceeds USGS range in two test pit samples), barium (exceeds Fresno ANG range one time), cadmium (exceeds Fresno ANG range), chromium (exceeds Fresno ANG range once), and copper (exceeds USGS range in three pit samples).

2.2.3 Groundwater Sampling Results

Temporary piezometers were installed to determine the groundwater flow direction. Two monitoring wells were installed (one upgradient and one downgradient based on piezometer data) as part of the confirmation investigation to monitor the groundwater quality from the uppermost water-bearing zone. Groundwater sampling was conducted in November 1990, February 1991 and June 1992.

Groundwater samples from the first two events were analyzed for VOCs, semivolatile organics, pesticides/PCBs, and TPH-diesel. The list of CCR metals was also analyzed for each groundwater sample. In June 1992, samples were analyzed for VOCs, TPH-diesel, and total lead. The number of parameters was reduced in June 1992 due to a lack of significant detections in previous samples.

There were no TPH, VOCs, or semivolatile compounds detected in any of the groundwater samples.

Zinc was the only element detected at a level above quantitation limits. The detected levels of zinc were well below the 5 milligram per liter (mg/L) regulatory level established in the National Secondary Drinking Water Standards for taste quality. Lead was also reported in groundwater samples. Detected concentrations were within the range detected in background wells (IT, 1992).

At the issuance of the SI Report in 1992, Site 4 was removed from further sampling activities. This decision was based on no significant evidence of chemical contamination in either soil or groundwater and on evidence showing that no hazardous materials were ever disposed in the area. As a result, no groundwater samples were collected from the monitoring wells after June 1992.

2.3 Hazard Evaluation

A preliminary risk evaluation was conducted to quantify the risk to human receptors or the environment that may occur at Site 4 resulting from the potential exposure to site-related chemicals. A summary of findings from this evaluation are included in the following sections. Risks of exposure to chemicals of concern (COC) identified in Site 4 media were quantified for existing and predicted land use conditions. Exposure pathways evaluated for soils was limited to dermal contact during possible excavation. For groundwater, the only conceivable

exposure route determined was via drinking water. A complete explanation of hazard evaluation methods and selection of COCs is included in the SI Report (IT, 1992a).

2.3.1 Risks Associated with Site Soils

No concentration of any organic or inorganic constituent in soils exceeded established action levels or maximum contaminant levels (MCL), except lead in one sample. However, the concentration reported is below the current State health-based concentration which would cause a risk due to exposure to the soil. A conservative leaching model, which is designed to overestimate potential risks to a receptor, was used to estimate the maximum possible concentration of organic compounds in groundwater as a result of leaching from the soil material. The potential maximum leachate concentration for three organic compounds exceeded their respective MCLs. The predicted leachate concentrations only slightly exceeded the MCLs.

2.3.2 Risks Associated with Groundwater

No site-related organic compounds were detected in groundwater at this site. All of the inorganic constituents measured in the downgradient wells were within the range of the concentrations measured in the upgradient wells. Therefore there are no COCs in groundwater for this site.

Exposure risks for groundwater were evaluated for chemicals that may leach from the overlying soil. The results of modeling indicate that potential groundwater concentrations of three chemicals, methylene chloride (7.7×10^{-3} mg/L), benzo(a)anthracene (1.2×10^{-4} mg/L), and benzo(b)fluoranthene (2.6×10^{-4} mg/L) due to leaching from soil slightly exceed acceptable levels (5.0×10^{-3} mg/L, 1.0×10^{-4} mg/L, and 2.0×10^{-4} mg/L, respectively). For chemicals to enter the groundwater system they must be transported some 80 feet to the water table. Considering the thickness of the vadose zone (approximately 80 feet) and the low annual rainfall, it is unlikely that a sufficient driving force would be created to carry chemicals to groundwater.

Due to the lack of significant concentrations of organic or inorganic constituents in the soil, and the lack of any chemicals in the groundwater, Site 4 does not present a threat to human health or the environment based on this evaluation.


3.0 Conclusions

Environmental sampling activities at Site 4 have confirmed limited contamination associated with past use. A total of 52 SOV samples, eight test pits, two piezometers, and two monitoring wells were installed during the SI at Site 4. Soil samples were collected from the test pits and three rounds of groundwater samples were collected from the monitoring wells. No significant concentrations were detected in the soil gas samples. Several semivolatile compounds were found at detectable levels from four of the test pits. Several metals were also found at concentrations exceeding either the site-specific or established regional background ranges. Lead was the only element which exceeded both background ranges, but is not considered a threat based on current acceptable State health-based standards. Groundwater samples that have been collected indicate that the local groundwater conditions have not been adversely impacted by site-related activities. Risks evaluated for applicable and predicted exposure routes for chemicals detected in soil and groundwater indicate that Site 4 does not pose a threat to human health or the environment.

4.0 Recommendations

Based on investigation results, hazard evaluation and the lack of evidence that any hazardous materials or wastes were ever disposed of at Site 4, it is recommended that Site 4 be removed from any further investigation, sampling, or risk-based analytical activities.

The ANGRC has reviewed the available data and recommends no further action under the IRP at Site 4, Suspect Burial Area, Fresno ANG Base.



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Civil Engineer Directorate



Date

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